

The British colonial ‘divide and rule’ concept: its influence to transport access in inner city of George Town, Penang

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Abstract George Town, Penang, is the oldest British colonial city in South East Asia. The colonial settlement layout in the inner city area is still intact today. The establishment of George Town as a trading centre had attracted immigrants from all over the world, especially from Asia (Chinese, Indians and Arabs). Recently, George Town has been enlisted under the UNESCO World Heritage Lists as an outstanding example of traditional multi-cultural settlement. The uniqueness of this inner city is that the formation of its urban pattern is the result of ‘divide and rule’ concept adopted by the British authority. Under the ‘divide and rule’ concept, these immigrants were located to settlement areas based on their ethnic background under one leader known as ‘*kapitan*’ (captain). The study finds that transport access in this inner city was influenced by the ‘divide and rule’ concept. Unlike formation of well-planned gridiron pattern in other British colonial cities such as in North America, Canada and Australia, the formation of the urban pattern in George Town has an irregular gridiron pattern. This type of urban pattern is typical under ‘divide and rule’ concept and this had indirectly influenced the setting and planning of the present street access and transport networks.

Keywords Divide and rule · Irregular gridiron · Transport access

Introduction

George Town is the oldest British colonial town in South East Asia. It became one of the British provinces in 1786 when Captain Francis Light established a British settlement at the northeastern part of Penang Island. The intention behind the establishment of the colonial towns is to monopolise the regional trade and to exploit the local economy (Galantay 1975). The establishment of George Town as a portcity had attracted traders from many countries especially from Asia to participate in the trade. Application of the

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gridiron layout is very crucial in the development of colonial towns throughout the British Empire. The British had used gridiron layout to mark for new settlement areas to cater for the influx of these immigrants. In the case of George Town, the gridiron layout tells an important story of the street settings under ‘divide and rule’ concept of governance by the British authority.

The gridiron layout was derived from the classical Roman city, which was at that time, popularly adopted in Europe. The layout represented the influences by the age of reason using mathematical understanding as the fundamental principle. It inspired the expression of straight lines to organise the street settings of the cities as a sense of ‘control’ and to bring about the condition of ‘order’ in urban planning (Corbusier 1971). The British applied ‘divide and rule’ concept in planning for the settlements based on ethnic backgrounds. The gridiron layout influences the urban land use patterns in George Town and the use of these spaces. The boulevards, streets and roads were used as the boundary for these divisions. The concept of the gridiron street layout indirectly had shaped the city’s transport access.

The gridiron settlement layout: concept and its establishment in George Town

In general, there are two types of gridiron planning patterns adopted by the British authority in their conquered land: (1) Formal Gridiron Pattern (2) Informal Gridiron Pattern. The formal gridiron pattern has a systematic planning layout, using an understanding of mathematics to gain the condition of ‘order’ and ‘control’ in urban design during an Age of Reason. This type of gridiron was able to be constructed for all new towns and cities in the British colonies such as the United States, Canada and Australia (Fig. 1). Unlike the British provinces, British colonies were the British primary territories, which became a



Fig. 1 An example of gridiron layout in town planning of the fortified port city of New Orleans, Louisiana in 1764 (12 years before Captain Francis Light established George Town as a trading centre)

major focus of the British government in England. This territory is aimed at setting up colonies for the immigrants from Britain who were interested to possess their own land and to settle in the New World. Figures 1 and 2 show that the gridiron layout was possible to be built efficiently and in accurate dimensions because its design was supervised by town planners and land surveyors.

Houghton-Evans (1975) argued that it was during the Renaissance period that professionals specialised in town planning started playing an important role and was entrusted by the government to design the city's masterplan. With the existence of the land survey profession in the eighteenth Century and the use of theodolite in town planning, the gridiron can easily be constructed on site. If we refer to the practice and development of gridiron planning in the United States, Canada and Australia, we will find that this planning layout is used to develop new settlements (Hassan 2001a, b). It required simple construction and administrative process. The government will gazette new land plots and later sell to the buyers. This method had speeded up the growth of the colonial city. A similar method was proposed by Ebenezer Howard in the development of the 'Garden Cities' in England (Hassan 2005).

The British had referred to the concept of gridiron layout in town planning in America and Australia from the model of primary Roman cities (colonies). One of the best examples is the ruin city of Timgad built in 100 A.D. as illustrated in Fig. 2. This city was built in gridiron layout using rectilinear lines in a formation of square geometry. This layout had given the Romans the ability to administer the city with good traffic circulation, water supply, public security and level of cleanliness (Corbusier 1971). Like modern cities today, the Roman cities also experienced problems with the traffic congestion of horse riders, carriages and pedestrians, and for them the use of the gridiron was the solution to tackle the problem (Houghton-Evans 1975). In case with Timgad, each block of its squares in gridiron layout was 70×70 Roman feet able to contain with maximum of 4 unit houses. The Romans had also regulated specific minimum width for their streets which were 8 Roman feet for the carriages (vehicles), 4 Roman feet for horse riders and other animals, and 2 Roman feet for pedestrians (Houghton-Evans 1975).

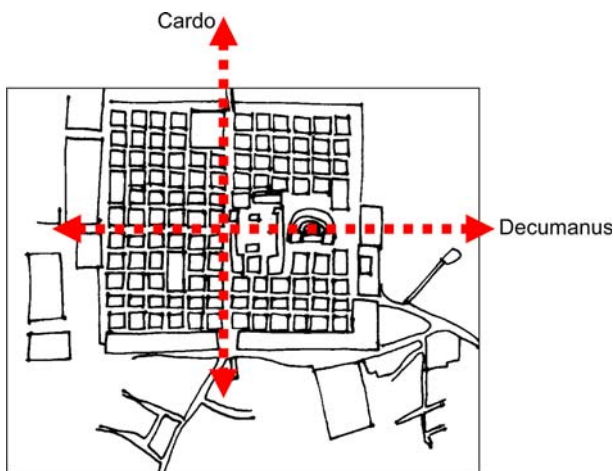


Fig. 2 A sketch drawing showing gridiron layout in the ruined city of Timgad, Algeria, and orientation of two primary street access in Roman town, *Cardo* dan *Decumanus*. (Redrawn from an illustration in a book titled *Architecture: From Prehistory to Post-Modernism/The Western Tradition*)

The gridiron pattern was not truly invented by the Romans but it was copied from the Greek town planners. Gridiron was an innovation by the Greek town planners, a popular settlement's layout when establishing new Greek colonies across Mediterranean Sea including an area known as 'Italy' today. The earliest use of the gridiron pattern was traced back to 479 B.C., a reconstruction of the city of Miletus (Fig. 3) by the great Greek planner Hippodamus due to its total destruction from Persian army's invasion in 494 B.C. (Grimal 1983). Hippodamus introduced a simple layout plan for the reconstruction, which are like a chessboard pattern. Miletus since then became a model of the Greek towns for the construction of new towns like Priene, Olynthus and Posidonia in Greek colonies.

The Romans had upgraded the pattern by adding two primary streets which were *Cardo* and *Decumanus* (Fig. 2), two intersecting streets at 90° angle (Houghton-Evans 1975). *Cardo* referred to a broad street oriented to North-South axis whereas *Decumanus* was a broad street at East-West direction. These two streets provided main transport access to the important places in the city such as forum (administrative centre and public spaces), amphitheatre and agora (market place). *Cardo* and *Decumanus* (the streets) divided the town into 4 primary quadrants, an introduction to the zoning system as noted by Houghton-Evans (1975) and Rykwert (1976).

The informal gridiron pattern has an irregular layout because its constructed gridlines are not able to reach the standard of accuracy. This type of gridiron was used to build colonial portcities and mining towns in the British provinces such as Malaysia, India and Singapore. Unlike the British colonies, British provinces were not British primary territories, hence they received less focus from the British Empire. There is no exploration prior to setting colonies for the British settlers. In the case of South Asia and South East Asia, the British government in England had entrusted its corporate body, the British East India Company to manage and develop the economy of these territories. The construction is supervised by military officers who were not specialised in town planning and land survey. They were applying timber sticks and ropes to measure the gridpoints and lines. They were not able to get accurate dimensions to construct the gridlines using this measuring technique. The result was an irregular gridiron layout (Hassan 2004). This situation happened because provinces like George Town was, as noted by Abel (1985), regarded as a temporary place to live, and they were only interested to exploit the local economic resources.

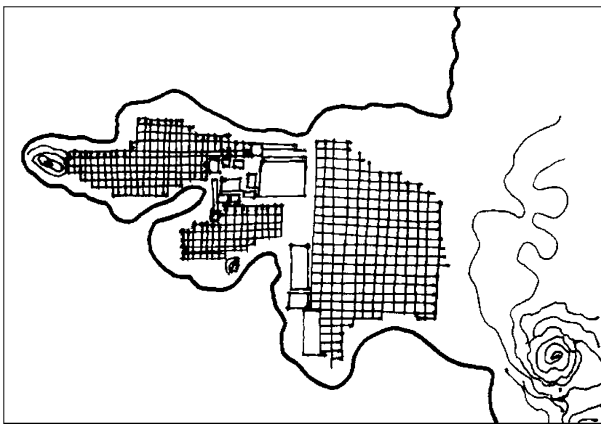


Fig. 3 Reconstruction of the city of Miletus after 494 B.C. using gridiron layout by Hippodamus. (Redrawn from an illustration in a book titled *How the Greeks Built Cities*)

No planner and land surveyor was assigned for planning this new settlement. The British officers who specialised in their related fields like architects, planner and engineer were assigned to come later to George Town when the British found that George Town was a prosperous portcity, and it was not regarded as a temporary place to live. They then regarded this province as a land of opportunity that they preferred to build grand buildings and monuments as if they would settle there permanently (Abel 1985). They aimed that by applying the simple layout, they were able to speed up the construction.

The use of the ‘divide and rule’ concept itself described the role of the British administration as having less authoritative control in the town planning of George Town. It gives more authority to the local residents who were divided into different zones based on their backgrounds to manage the construction of their private spaces. The same condition occurred in many Roman towns in Europe. The less control by the local authority as argued by Saalman (1968) would result more focus to the development of private spaces compared to public spaces. This situation became more acute in Europe during Medieval Ages and the result can be seen until today in most town and cities in Europe. Street access is one of the public spaces in the city. With less control by the local authority, the role of street settings and its networks had conflicted with the needs of the construction of private built-up areas. Saalman (1968) argues;

The resulting rule governing the width of streets may be simple: streets will be as narrow as they can be while allowing for transit of goods and persons. The tendency of buildings was to encroach on the adjoining streets. ... Encroachment achieved its possible maximum when a house extended entirely across a street, leaving only underpass of minimum height for viability.

The gridiron, whether it is established based on formal or informal layout, gives many advantages to the development of the colonial portcity and mining towns in the British Empire. It was recorded to be the best planning model and the most successful pattern in the history of colonial settlements. The British had referred to the Roman model in their colonial economic development. England before was one of the Roman provinces in Europe. They learnt that the Romans not only conquered foreign lands but they were also exploiting the local economy (McKay et al. 1987). Establishment of trading centres in the Roman Empire were important for the growth of their monetary-based economy (Hassan 2004). The Roman armies were entrusted to explore places in Europe for their trading centres. They had opened many Roman towns to serve for these purposes (Boethius and Ward-Perkins 1970). Many cities in Europe today such as London, Munich, Paris and Manchester were established by the Romans. The influence of the British architecture and town planning in their conquered lands were so great and could be much reflected with what that had been practiced by the Romans throughout their empire (Morris 1983).

In Roman times, they referred to these towns as ‘castrum’ (a plural word originated from singular word, *castra* which mean Roman military camps) (Barnett 1986). These towns were the Roman military settlement by Roman armies to protect these colonial towns from threats and invasion by their enemy. The British had referred to this model of the Roman towns and their economic viability, and adopted this model for the economic development in their empire (Hassan 2001a, b). One of the early actions made by the British was to establish a corporate body, The British East Indian Company, to work on this monetary-based economy. For these purposes, this company had opened many military towns to serve as the trading centres. These military towns were built using the Roman gridiron layout concept.

The gridiron layout, as argued by Wycherley (1962) was used because of its contributions to these factors as follows:

(a) Simple and easy to build

The gridiron layout is the most simple and easy to build. It requires minimum time, human resources and costs spending for its design process and construction operation. The design brief is to establish a colonial town where the objective is to create a 'quick construction' of the new town. The gridlines represent the transport access. The preplanned layout and transport access will be able to speed up the growth of the town as a trading centre. The layout is able to provide additional settlement instantly to the large influx of the immigrants.

(b) Transport access

The gridiron layout clearly mark, not only borders of the landplots, but also public transport access. Provision of this transport access gives the authority traffic control over all the settlement areas. All residents use these streets as primary access to go from one place to another, and as primary access for commercial routes. This transport access provides a positive development to the growth of George Town. All residences were provided with good transport access and basic services. The gridlines in the gridiron layout are the symbols of the transport access. These transport access are designed in hierarchical orders: the boulevards as primary access, streets as secondary access, and roads as minor access. A boulevard is commonly a two lanes and two way streets. It has a divider in the middle of the two-way street division. Some dividers have about one meter's width designed with landscape, and in case of George Town, Penang, many borders have no landscape at all, and many of them have 1 feet (3,000 mm) width fitted with fences to hinder pedestrian crossings.

(c) Systematic basic services

Due to its regularity, gridiron layout is a very adaptive layout for installation of the public services like water supply and drainage system. Today, this layout can be easily fit with wiring for electric supply and telephone service, even very adaptive to GPS system. The boulevards, streets and roads are government property. The local authority represents the government body that builds and manages these services. Due to provision of these services, the authority charges various types of taxes to the residents. These services are commonly built along the boulevards, streets and roads. Additional land area, 2 m width at both side of the streets, are provided in the layout design for these services as well as for pedestrian walkways.

(d) Issues in land ownership

Using gridiron layout will hinder issues of land ownership among the land owners. As the boulevards, streets and roads are the government property, these properties function as border lines between one area and another. This layout clearly marks the landplots and their borders. When the streets function as the neutral zone and they perimeter all the zones, there is no possibility of clashes in land ownership. No party will involve in clashes about boundary issue of their landplots. This issue normally happens if the private land plot division created by the local authority sharing the border with other owners. In the case of George Town if this issue occurred, it would have been more critical here compared to other British colonial towns in America, Australia and Canada because George Town was populated by people coming from different ethnic backgrounds, therefore; the application

of gridiron layout with ‘divide and rule’ concept is more critical. Clashes in land ownership could easily cause racial riots. If this happens, it could retard the development of George Town as a trading centre.

‘Divide and rule’ development concept in George town, Penang

The concept of the city’s development by the British authority in George Town had contributed a significant impact to the formation of urban pattern and transport access in George Town. The British had applied a common urban pattern in building their portcities and mining towns in their conquered lands, which was gridiron planning layout. It was not surprising that the gridiron concept was used as the British officers who were entrusted to build the portcity and town had a military background. The gridiron is a basic army’s formation of lines in columns and rows. Having been trained with a military background was important because they had frequent ground battlefields against native people and other European armies who were at the same time trying to claim domination over the territories.

In the case of George Town, Captain Francis Light was assigned under a special mission by the Governor of British East Indian Company to monopolise trade with China in this region over the Dutch colony operated in Batavia (old name of Jakarta), Indonesia. The island was chosen as a port city because Francis Light thought that it has a strategic geographical location to be a trading centre. In this case, Francis Light had a military background (the British captain) but he was assigned to work as a town planner and economist to give the decision for the location of the new British portcity and its establishment in Southeast Asia. He was later appointed as the governor of this island (Penang). Under his effort, the British were able to acquire Penang on lease basis from Sultan (King) in the State of Kedah. However not long after that, the British were able to gain full power over the island after the defeat of Kedah armies by the British armies. This battle occurred when Sultan of Kedah armies invaded Fort Cornwallis. The reason is the Sultan of Kedah was angry over broken promises by the British as part of the agreement to protect the State of Kedah from paying tribute to King of Siam that prompted threat and invasion by Empire of Siam (Thai) in Kedah.

The British armies under Captain Francis Light had used gridiron layout when they established their first settlement. The location was at the northeastern part of the island known as Tanjung Penang (Peninsular Penang). At this location, Francis Light had built a defensive fortress, Fort Cornwallis, and it was perimetered by moats. The British built this fortress originally using local nibong (type of palm trees) trunks as the primary material to perimeter an area of 417 square feet. Figure 4 shows evidence that Fort Cornwallis was a typical design of fortress built by the British armies using the concept of gridiron layout. It is not really well planned because its layout was not perfectly constructed. This type of the planning layout was the ‘informal’ gridiron pattern. The informal gridiron planning pattern was a less organised gridiron layout in city planning.

In the British settlement like Fort Cornwallis, this pattern was the result when it was planned by the British army officers, who were entrusted to build the fortress. These officers did not have a background in urban planning, their education in town planning was limited, and they were not the planners who should involve in the design of the settlement. As a result, the dimension of the grid lines built by these officers did not able to meet accuracy’s standard. At that time, the British armies did not only work in military but were

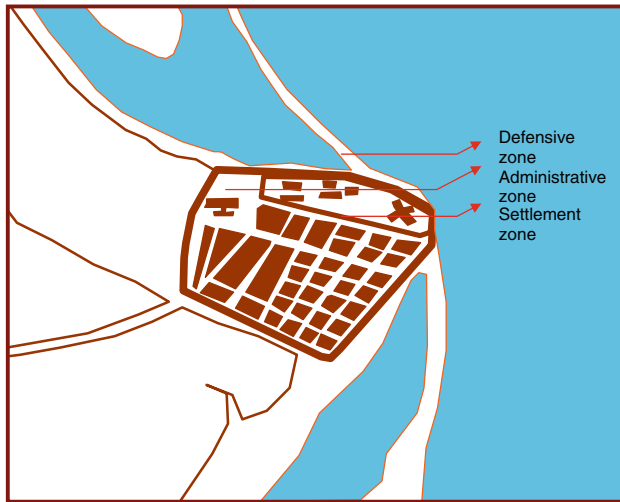


Fig. 4 The earliest settlement in George Town, Penang in the eighteenth century planned with informal gridiron pattern. The waterfront is at the north and east of the town. *Source:* Redrawn from the original map from Penang State Museum

also assigned to explore new settlements for portcities and mining towns at their conquered lands.

These soldiers were very good in setting their parade formation in grid lines of rows and columns. It symbolised the importance of discipline required in the military profession. However, this specialisation was limited. They were not specialised in planning for large areas of settlements, which require involvement of professional urban planners and land surveyors. George Town was a British province, not a British colony. It was the British secondary portcity, hence gained less focus from the British Empire. By 1804, this fortress was rebuilt using clay bricks when Colonel R.T. Farquhar had administered as the Governor of Penang. This new clay brick's fortress was designed by architects and was built by labourers who were the prisoners from India. This new fortress has a Renaissance design and style.

George Town had a city layout divided into eight primary zones. Figure 6 illustrates an inner city (core area) of George Town, which had been zoned by the British authority during colonial period. Under 'divide and rule' concept, the immigrants were placed to the allocated settlement zones based on their ethnic backgrounds and beliefs. Each zone was under one leader known as '*kapitan*' (captain). Communities in each zone were given rights to develop the areas without interference from the British administration. Each zone were perimetered with street borders to separate one from another.

Shortly after the British occupation in Penang, the British had opened several new settlements around Fort Cornwallis as illustrated in Fig. 5. Gridiron layout marked the land plot division. In its early phase, Indian traders from Southern India (Kling tribe) were the first immigrants settled in this portcity followed by the Indian Muslims (Chuliahs tribe) and later the Malays coming from Malay archipelagos especially the Mainland Malays, Bugis (from Sulawesi) and Achehnese (from Acheh, North Sumatra) (Lim et al. 2000). They settled at Acheh Street, the earliest trading area and settlement by the Malay Muslims in George Town (Khoo 1992). The streets functioned as the boundaries of each zone.

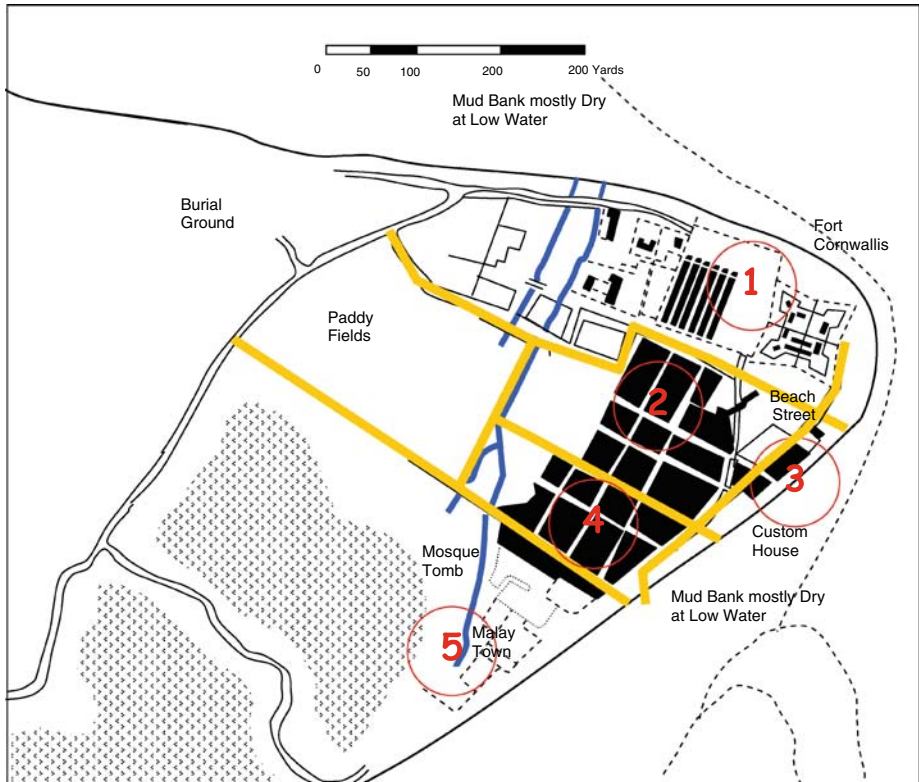


Fig. 5 The city layout in George Town in 1804. *Source:* Fort Cornwallis Gallery

Zone 1 was for the British settlements and administrative areas (Fig. 6). Most of the Europeans who lived in this area were the British officers who worked in the British administration and trading sectors such as the government top officers, managers or owners of the estates, investors, bankers, and traders. Fort Cornwallis, the British military camp was also located in this zone. Bishop Street divided Zone 1 from Zone 2, and Zone 2 was allocated for the Indian settlement. This zone together with a part of Zone 4 was also known even today as ‘Little India’. This area is located between Light Street at the north and Chulia Street at the south bordered with Beach Street at the east and Masjid Kapitan Keling Street at the west. This area was popular with a variety of spices trades from Southern India. Zone 3 is a financial centre and portcity.

Beach Street was constructed as a primary transport access and it created a division between this zone and ‘Little India’. This zone was the most densely built-up areas with administrative offices, financial institutions, warehouses and commercial shop houses which were involved in trade. Location of administrative offices near the harbour complex like custom offices, police department and marine offices was crucial to give the government control over the trading activity. Financial institutions such as banks and financial offices played an important role in handling the exchanges of trades. Warehouses were built to store the trading commodities and most commercial shop houses functioned as the private offices for shipping agents, general importers and tin refiners. Zone 4 was a settlement for the Indian Muslim (chuliahs) known as ‘Little Madras’. It is separated from

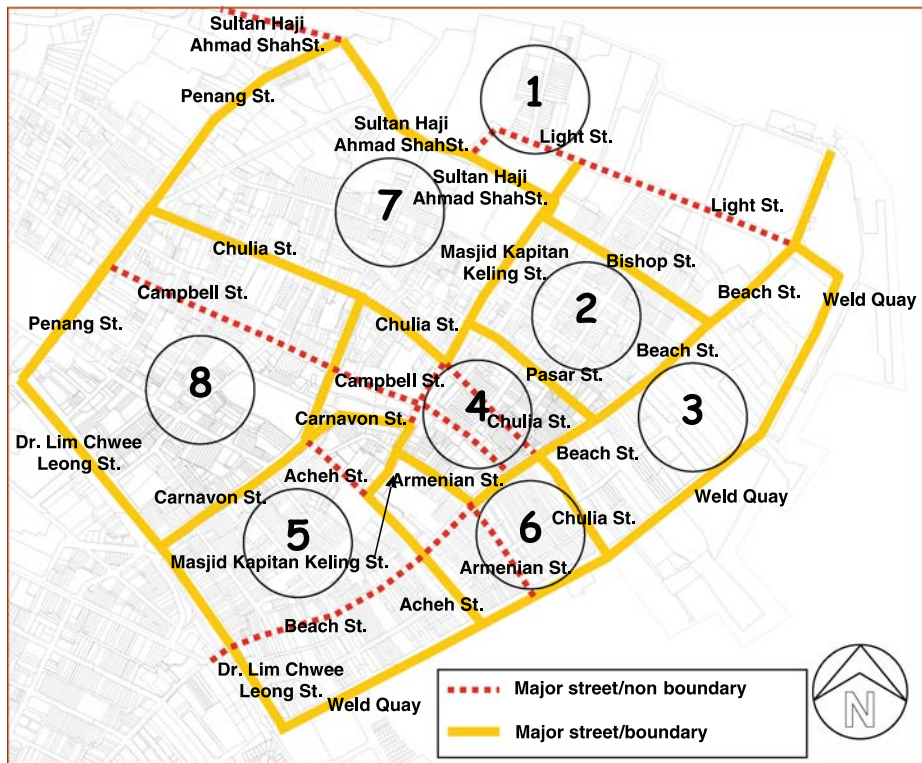


Fig. 6 The transport access at the inner city of George Town planned by the British authority

Zone 2 by Pasar Street. Zone 5 was the Malay town. This area was also settled by Arab traders. Mosts were from southern region of Arab Peninsula like Hadramout region, Yemen. They mixed with the Malay community, and some intermarriages happened between the local and Arab traders.

The establishment of the Chinese trading communities in George Town was to come later when they were attracted to the abundant commodities traded, the reason that they had changed their trading place from Malacca (at that time, it was under the Dutch occupation) to George Town, Penang. The British liberal attitude in the establishment of the settlement and the free trade concept were the contributing factors why George Town became attractive to the Chinese traders. The presence of Indian, Malay and Arab traders in George Town was important because for generations, the Chinese traders had done trades with them in this region at Malacca which used to be the trading centre under the Malaccan Sultanate. They came from several distinctive tribes; Hokkien, Cantonese, Teochews and Hakkas from many territories in the Southern China like Kwantung, Fukkien, Chekiang and Kiangsi. These subgroups composed their own clans (popularly known as 'kongsi'). Due to this situation, the British administration had appointed a *kapitan* for each subgroup in order to avoid clashes amongst themselves. With this institutionalised subgroups, it is easy for the British administration to have a control over all the Chinese communities in George Town (Salleh 2001).

The existence of the Chinese community in George Town gave a contribution to the development of China town (Bristow and Lee 1994). According to E. J. Seow in the book

titled *The Straits Chinese Shop House*, there are dominant themes of the Chinese shop house in any colonial urban environment in South East Asia (Yap 1990). These eight zones (Fig. 6) are as follows: (1) British Administration and Settlement (2) Indian Hindu Settlement (3) Port and Financial Area (4) Indian Muslim Settlement (5) Malay Settlement (6) Chinese Settlement (East) (7) Chinese Settlement (North) (8) Commercial Area and Market Place.

‘Divide and rule’ concept of the zoning system would enable the British authority to govern George Town without facing major racial issues and probable opposition by the local people and immigrants. The British authority had appointed one leader in each community. Under the ‘divide and rule’ British policy, the community were free to manage their religious, economic and cultural activities under an appointed leader or ‘penghulu’ (for the Chinese and Indian immigrants, their appointed leaders were known as kapitan). Application of this system had kept out the British authority from interfering the community’s internal affair. This meant that each community were free to practice their belief and tradition. This liberal concept of the British administration had attracted more merchants coming to George Town. This liberal administration also gave the British authority ability to focus on their primary agenda in establishing George Town as the trading centre in South East Asia. This liberal concept was however a factor in shaping irregular grid layout in the settlement patterns. Uncontrolled development under the British authority had made the gridiron planning of the community settlements having less organised layout compared to those built by the British authority in Zone 1, 2 and 3.

The busiest area in George Town was at the waterfront areas which served as a harbour complex where import and export of the commodities involved. Beach Street was designed to serve as a primary North-South transport access with jetties built along the street for the trading activities. These two streets are the main street access to the government administrative buildings and commercial trading areas. At the other side of this street, there were many buildings like the Dutch ABM AMBRO Bank, Chartered Bank, immigration offices and shop houses. At that time, Weld Quay Street did not exist in this waterfront area. Beach Street was the street built along the eastern coast of Tanjung Penang. It is the nearest street to the coast where many additional jetties for ships’ landing, warehouses, offices and financial institutions were built.

In 1880, The British authority had done land reclamation over mangrove swampy areas along the eastern coastal area of Tanjung Penang to Perangin River. The purpose was to provide more areas to serve for development of the port and trades. This land reclamation activity created issues especially the environmental risk to the development of Perangin and Penang river mouth. This issue was known as ‘Weld Quay Question’. By 1832, land reclamation was completed in many parts of these swampy areas, and in 1881, this activity had covered areas at Perangin Beach. Many new streets and roads were built on this reclaimed land. New streets built in parallel to Beach Street were Victoria Street and Weld Quay.

Many other streets also were built at the intersection between Beach Street and Weld Quay. Most streets carried the name ‘Ghat’ for its first name such as Ghat Chulia Street, Ghat Aceh Street and Ghat Pasar Street. According to the local people, ‘Ghat’ means ‘jetty’ in Indian language. In 1883, land reclamation continuously operated to cover coastal area at Penang River, located at the south of Perangin River. Since then, Weld Quay became a primary seafront street access (*Cardo*) superceding the Beach Street. Its first name was derived from the last name of Sir Frederick Weld, who was at that time the Resident of the Straits Settlements. Many important buildings later were built at the reclaimed land at the west of Weld Quay while the east was the harbour full with small

boats which transported goods from the ship to the warehouses. The type of building dominated the landscape was shop houses. These buildings had two to four storey height built with bricks and cements.

Analysis and findings

The analysis done is to identify the influence by which the concept of informal gridiron planning practiced during the British colonial time affected the design of the past and present urban land use pattern and its impact to transport access in the inner city of George Town. Interesting findings pertaining to the analysis done includes:

1. The British had less focus on the conquered provinces in India and Southeast Asia in contrast to the colonies in America and Australia. The British had entrusted British East India Company to govern the provinces. These provinces were regarded as a temporary place to live, with the main interest being to exploit the local economic resources. The British established secondary colonial towns with less control on town planning pertaining to the street layout, the basic public spaces in the town as noted by Saalman (1968). The result is the informal gridiron layout giving more community control in each zone in the building and configuration of their private spaces over the control of street and public spaces by the British authority.
2. A person with a military background was assigned as a town planner, economist, manager and administrator during the British colonial time in George Town, Penang. This shows that the person who was not really specialised in town planning was involved in the establishment of George Town.
3. The layout planning in inner city of George Town was informal gridiron layout inherited from the secondary towns of Roman city's planning by the British local authority. The gridiron, whether it is established based on formal or informal layout, gives many advantages to the development of colonial cities. It was introduced by the ancient Greek planners, then upgraded by the Roman, and used by the British in planning the inner city of George Town. The advantages were simple and easy to build, good transport access, systematic basic services, and resolving issues in Land Ownership.
4. The *Cardo* and *Decumanus* still persist in the informal gridiron layout in George Town. Beach Street was designed to serve as a primary North-South transport access (*Cardo*) with jetties built along the street for the trading activities whereas Lights Streets serves as a primary East-West transport access (*Decumanus*). Weld Quay Street becomes a new primary North-South transport access (New *Cardo*) after land reclamation. These two streets are the main street access to the government administrative buildings and commercial trading areas.
5. Role of boulevards and streets were very critical in the 'divide and rule' concept. They functioned as boundaries to avoid clashes between the communities residing in George Town. The British authority control over these transport access was crucial as a governing body. The streets functioned as a neutral zone. The street layout hindered clashes of land ownership between one community and another. The boundaries made by minor roads also had hindered the local authority from facing internal land ownership issue. In the case of George Town, most primary transport access used as the settlements' boundaries were primary streets. Figures 6 and 7 show two types of the streets. The light brown colour lines are primary streets which function as the

zoning boundaries whereas the dashed red colour lines are primary streets but they do not function as boundaries. Some primary streets are boulevards with two lanes in each direction landscaped or fenced at its divider. These boulevards and streets are as follows:

- (a) Primary streets (boulevards), functioned as the zoning boundary e.g. Weld Quay (New Cardo after land reclamation), Beach Street (Old Cardo), Sultan Haji Ahmad Shah Street, Masjid Kapitan Keling Street, Penang Street, Carnavon Street, Chulia Street, Dr. Lim Chwee Leong Street
 - (b) Primary streets (boulevards) but not functioning as the zoning boundary e.g. Light Street (*Decumanus*), Campbell Street
 - (c) Primary streets e.g. Armenian Street, Acheh Street, Bishop Street, Pasar Street
6. Based on Fig. 7, we could learn the characters of the ‘divide and rule’ zoning concept of the settlement patterns in George Town Penang, how this concept had influenced the development of street access and transport networks. These elements are as follows:
- (a) All zones have clear boundaries marked by the informal gridlines.
 - (b) Streets play a crucial role in defining the transport access in gridiron layout, *and there are two primary street serving as Cardo and Decumanus*.
 - (c) Gridiron layout is used in the planning scheme of George Town. The reason is to speed up the construction of the town.

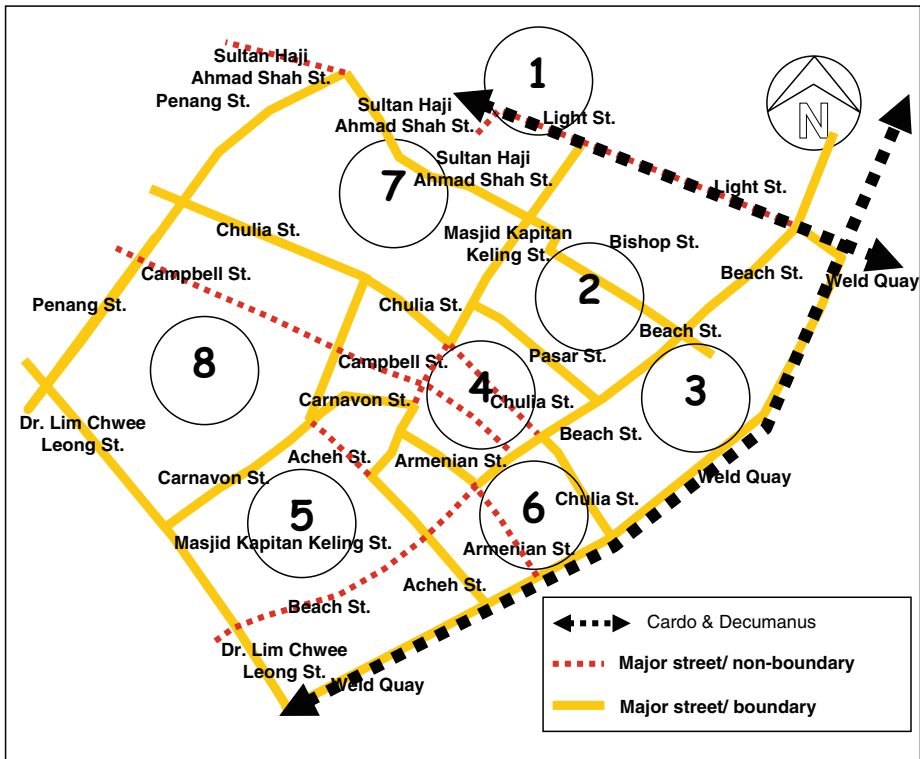


Fig. 7 Diagram of primary transport access in the inner city of George Town

- (d) The British Empire had less focus on the town planning of secondary colonial town like George Town. The planning of the settlement was entrusted to the British officers who were not specialised in town planning.
- (e) The British liberal concept under divide and rule concept allowing more authoritative power for each community the freedom to plan and build their settlement had created obliterated or irregular gridiron layout.
- (f) Boundaries of the settlements plays a very significant roles in forming primary transport access in inner city of George Town. All boundaries become primary street accesses. Most of these boundaries are the boulevards. There are eight boulevards and four-two-way streets. This means that 66% of the boulevards functioned as the zoning boundaries. Today, all of these boulevards are the primary public bus routes in the inner city of George Town.
- (g) Under divide and rule concept, control of transport access by the British authority were very important but at the same time the authority gave more authoritative power to each of the community to build their private spaces and places.
- (h) Concept of streets as the zoning boundaries is the most efficient solution for the streets access (major transportation routes) by all communities who lived in George Town. These streets were the neutral zones under control by the British authority, as a result; people in this city got good access from one place to another safely.
- (i) With this good street access to all zones, it is easy to the British authority to built basic services such as water supply and sewerage system along the streets to all of the communities. The British authority imposed house rates for the services and management.
- (j) There are two boulevards serve as the primary access but they are not the streets' boundaries. These boulevards are Light Street and Campbell Street. The reason is that Light Street serves a major access to the important administration buildings such as Penang State Assembly Hall, city halls, court building and Fort Cornwallis. The other reason is that Campbell Street is a street access to commercial areas such as market place and shopping areas. Creating these two major accesses is necessary to provide good and easy public access for administrative affair and commercial activity.
- (k) There are two most important transport access in this inner city, which are Light Street and Weld Quay. These two boulevards are similar to the Roman's 'cardo' and 'decumanus'. Cardo is the north to south major transport access whereas decumanus is the most important east to west transport access. Light Street is the most important boulevard to the British administration buildings. Its orientation is closed to east to west direction. On the other hand, Weld Quay is the most important transport access for trading activities. Its orientation is about north to south direction. Before land reclamation in this area, the most important transport access is Beach Street.

Conclusion

Divide and rule concept is an influential factor that had created irregular gridiron layout in the inner city of George Town. The result is a formation of irregular layout for transport access. The transport access became important roles marking boundaries of each zone in

George Town. Under the divide and rule concept, the immigrants who come to George Town were placed to the areas based on their ethnic backgrounds and beliefs. The reason was to hinder clashes because of issues in land ownerships, ethnic background, cultures and religious practices. Control of the transport access by the British authority was crucial in giving good and safe transport access and basic services to the residences. This shows the legacy of the Roman town planning under the British colonisation, creating towns to serve monetary-based economy in their conquered lands. The uniqueness of the transport layout in George Town is that it creates an outstanding example of a traditional multi-cultural settlement which best images the culture of tolerance, peace, diversity, conflict and continuity (*Tentative World Heritage List Malaysia* October 2000, 8).

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